RECENT JOURNEY OF EXPLORATION ACROSS THE CONTINENT OF AUSTRALIA; ITS DESERTS, NATIVE RACES, AND NATURAL HISTORY.

BY

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Australia, or New Holland as it was formerly called, about which I am to speak to-night, is, in respect to its natural formation and products, no less than in the manner of its rapid settlement and development, worthy of more attention than is generally given to it by those who are not directly or indirectly interested in its progress, its welfare and description. Vast deserts of stones and arid sands; winds from the north that blow hot and those from the south cold; black swans, as well as those which are white; trees that cast their bark instead of their leaves; tulips and lilies that grow high in the air, and ferns which grow big as trees (where the fauna consists almost entirely of the nearly extinct marsupial); the duck-bill Platypus, a curious animal, half bird and half fish (*Ornithorhynchus anatinus*), is also found and wondered at;—these are but a few of the natural wonders of this strange clime, which lies far on the other side of the world, where the sun is now shining, and where the midnight chimes are being rung while we are at our noon-day meal, and the blasts of mid-winter, which, by-the-bye, are not very cold, sweep over the hot and parched country during our summer months. Since I should only bore you by going into any geographical details and statistics, and as time will not allow me to go into these subjects as thoroughly as I should wish, I propose to leave them out; those who already know them will probably here give a sigh of relief, and those who do not can solace them-

selves by knowing that those particulars are recorded in, and can be read from, any geographical school-book. There are, however, one or two later discoveries than are usually written in those books, viz.: The northern territory of South Australia, which was formerly North Australia, now belongs to the colony of South Australia, and is under that government. The French claim to have discovered Australia in 1503, but the first authentic record that we have is a map by the Portuguese, of an expedition under one Manuel Godinho de Heredia in 1601. It, however, remained wholly unexplored and virtually unsettled by civilized man until the present century, when the efforts of the British Government and the discovery of gold combined caused a rush to its shores, and villages, towns and cities were rapidly built and populated. The fact that so little is known about one of the most civilized quarters of the globe, is due to a variety of causes. About the time the colony began to assume importance the discovery of gold in California centered our attention. The Anti-Slavery contest, the great civil war, and the Know-Nothing excitement kept our nerves strained upon the events at home. Within the past ten years, however, our attention has been called to it, and shipload after shipload from this and other countries has been sent from the surplus population to new homes in the less thickly inhabited lands of the Antipodes. Three years ago, from an office in London, England, where they ought to know the whereabouts of the British Colonies, a letter was sent addressed to the Chief Secretary of Victoria, New South Wales, South Australia, which is similar to a letter addressed New Orleans, Wyoming, New York.

Australia is the largest island in the world, having a superficial area of 2,975,000 square miles, a very little less than the whole of Europe. Its greatest length is 2,536 miles, and its greatest breadth 1,585. Its length lies between the Indian Ocean on the west and the Pacific Ocean on the east, and its breadth between the Arafura Sea on the north, and the South Pacific Ocean on the south. Australia can boast of none of those great mountain chains, lofty peaks or mighty rivers which Americans are accustomed to see; but Sydney and Port Darwin Harbors are probably as useful and grand as any in the world, not excepting Rio de Janeiro, Constantinople, Hong-Kong, or San Francisco. There are no great inlets except the Gulf of Carpentaria on the north coast. The enormous expanse

of country is almost entirely level, and geologists have puzzled over its formation. There are many indications that it was once the bed of the ocean. The interior was, until within a few years, as a sealed book; and even now the knowledge concerning it is not very general.

It is known that vast deserts exist, wholly without water. Absence of mountain ranges explains the absence of rivers and its general aridity. The highest range of hills is the Warragong, or Blue Mountains, which attain a height of 7,000 feet above the sea level. Despite the absence of highlands, the scenery is grand in the extreme, its wildness being diversified by immense precipices and gigantic fissures.

There are a great many salt marshes and lagoons in the centre and west, and in the east a few rivers which alternately expose their dried beds to the baking rays of the sun, and overflow their banks. Long and severe droughts sometimes prevail. In 1865 there was no rainfall in Central or South Australia, and cattle and sheep died by thousands every day. The largest navigable river in East Australia is the Murray. It has tributaries in the Darling, Murrumbidgee and others. In Western Australia there are the Murchison, Gascoigne, Fortescue, and De Grey. Many of the smaller rivers have their rise in the mountains and run inland, losing themselves in the hot sands of the desert. The continent is divided into five colonies; the largest is Western Australia, with an area of 978,000 square miles; its capital Perth, on Melville Waters of Swan River—a beautiful little place, settled in 1829. South Australia, including the northern territory, includes 906,858 square miles; its capital Adelaide, on the River Torrens. This colony was founded in 1836. Queensland is the next in size, consisting of 678,000 square miles; its capital, Brisbane. Then comes New South Wales, with an area of 323,437 square miles; its capital Sydney; and last, but not least in importance, is Victoria; it was settled in 1834, was originally a part of New South Wales, but was made a separate colony in 1851. It is separated from South Australia on the west by the 141st meridian of east longitude, and from New South Wales on the north by the River Murray, or a straight line from Cape Howe to the nearest point of that river. Victoria owns no part of the Murray the south shore being the boundary line. Her area is 86,831 miles —2,200 miles less than Great Britain. The colony, as you will ob-

serve, is situated within the most southeasterly portion of the continent, and its most southern headlands enter the temperate climate of the fortieth parallel. The mean temperature of Melbourne is 58° 8′, which is 8° higher than that of London, although the latter is 13° 11′ nearer the frigid zone than Melbourne, showing to what an extent Europe is indebted to the Gulf Stream for its warmth. Victoria probably is the richest, most prosperous and most thickly populated of the colonies; though by statistics New South Wales appears to be now wresting her laurels away. The colony owes its wonderful success to the gold discoveries of 1851, which in the year 1852 amounted to $70,000,000. The gold is generally found in quartz, granite and pophyry. New South Wales and Victoria are the largest gold-producing colonies, though each of the others add something to the enormous general yield. South Australia is noted for its copper; the Moonta, Wallaroo and Burra-Burra copper mines are all widely celebrated. Lead and iron, tin and maganese, and quicksilver are also found; the iron being widely distributed.

PREVIOUS EXPLORATION.

It is but recently that we have had any idea of the geography of the western half of the great Australian continent, and it is to the spirit of enterprise shown by the Hon. Thomas Elder of Adelaide, and by the governments of South and Western Australia, that a knowledge of it is due. The means placed in the hands of explorers by Mr. Elder, for years past, entitles him to more recognition than he has yet received; and I hold now in my hand a letter in which he says that it has always been his delight to identify himself with geography, and that he has much pleasure in forwarding to this Society a package containing the journals and maps of several of the explorers sent out by him, as also others in which he has taken an interest. Much has been done within the past four or five years to make known the character of that vast region, hitherto a sealed book to the world. Before describing Mr. Giles's journey across that waste, I will beg a few minutes to give a brief *resumé* of previous explorations, and point out the difficulties which the settlers and squatters encounter in pushing their way inland.

You will see that the continent is divided into two nearly equal parts by the overland telegraph line running between Port Augusta,

on the south coast, and Port Darwin, in the northern territory of South Australia, on the north coast. About thirty years ago, Ludwig Leichart undertook to explore the northeastern part of Australia. His first trip was successful, inasmuch as he accomplished what he undertook to do; the second time he turned back famished; and the third time he bravely started to cross from east to west, and has never since been heard of. Only a few bleached bones of horses, and some marks upon one or two trees, have been found to indicate his fate.

In 1841, Mr. Eyre—perhaps better known as Governor of Jamaica—made a march from Adelaide to King George's Sound, the record of which is filled with the most horrible details, thrilling incidents, and terrible tragedies in the history of Australian travel. He had one white man as companion and three natives. After they had been out some time and became short of provisions their horses nearly all died, and while Eyre was watching to see that they did not stray, his attention was drawn to the camp by the report of firearms. He hurried back to find his companion in the last agonies of death, and two of the black fellows gone with the firearms and provisions. He continued his journey with one boy. After undergoing terrible hardships, he received assistance from a French whaler, which enabled him to reach the western coast in safety. The Royal Geographical Society of England awarded him thei gold medal.

The same country was traveled by Mr. John Forrest, in 1869, with comparative ease, showing that the pioneers of any country have much greater difficulties to encounter than those who follow after them.

Captain Sturt, in 1841, endeavored to make his way north, but only reached one-sixth way across, and returned after suffering the greatest hardships and privations. One man, Poole, died of exhaustion on the trip.

Mr. Gregory also tried to penetrate the interior, accompanied by my friend the Baron Von Mueller, the able Government Botanist of Victoria.

And here, before this Society, let me tender my sincere thanks for the skillful way in which he, at great trouble, classified the plants I collected when traveling with Mr. Giles. Gregory found nothing but sandhills and spinifex.

John McDougall Stuart, the most renowned of Australian discoverers, in 1858 and subsequent years made expeditions north of Adelaide, in the endeavor to cross from south to north. His third attempt was successful, though fearful hardships were undergone, and the overland telegraph now marks his track as a lasting monument to a great man's work.

Frank Gregory was the next to try from the north coast, but only succeeded in getting some 200 miles inland, when he was turned back by the same barren country that stopped his brother.

Mr. John Forrest in 1862, and Mr. Hunt in 1864, and later still Mr. Alexander Forrest, and several others, tried from the west coast to get inland between the twenty-ninth and thirty-third parallels of south latitude, but dry, salt lagoons, samphine flats and scrub drove them all back.

Mr. John Forrest's expedition was sent out in search of Leichart, or traces of that important expedition, but none were found, and the party was driven back, like the rest, for want of water.

The costly and celebrated expedition of Victoria, sent out by that Government under charge of Richard O'Hara Burke, generally known as the Burke and Wills expedition, should not be forgotten. The party reached the Barcoo River or Cooper's Creek, from Meninde on the Darling, with little difficulty. Burke and Wills, leaving the main body on the creek, with two men left to try and reach the north coast, leaving orders that, if they did not come back by a certain day, the main body of the expedition was to return to Melbourne without them. The unfortunate men arrived just seven hours too late. They were too exhausted to follow; were without food, and had lost one of their party. The Victorian search expedition under Howitt found the one man who was sole survivor reduced to a skeleton, and lying in a native hut, some months afterwards. The unhappy man had subsisted for a long time on nardoo, the seeds of a species of wild corn. One of the men was left on the road down from the coast, as he was unable to travel on account of extreme exhaustion. The last entry in Wills's diary was, "My pulse is at forty-eight; my legs and arms are skin and bone, and, like Mr. Micawber, I must wait for something to turn up." Four expeditions were sent in search of the lost ones—two from Queensland, one from South Australia, and one from Melbourne. Howitt, the commander of the one which was successful, brought into Adelaide

the remains of the unfortunate men the same day that Stuart was received with honors for the very feat that Burke and Wills had accomplished.

Colonel Egerton Warburton tried now from the great Australian Bight, but after some eighty miles the old old story was repeated—he was forced to return, to save the lives of the party.

In 1872, Mr. Ernst Giles set out upon an expedition with two men and a few horses. The expenses of the undertaking were borne by gentlemen of Victoria. His starting point was Chambers' Pillar. Proceeding along the River Fink, he found dry creeks with an occasional water-hole; he travelled over sandhills, and through mulga scrub, with an occasional oasis to keep him from perishing. Shortly after leaving the telegraph line, the head of a huge lake (Lake Amadeus), with arms like an octopus, effectually put a stop to his further progress. The lake was dry blue mud, with thick encrustations of salt covering its bottom. Giles reluctantly returned, owing, I believe, to the disagreement of members of his party. The mulga scrub spoken of is an acacia, and generally grows on the desert. I do not know if I am justified in calling it a desert, for there is plenty of vegetation. This, however, is indicative of the excessive dryness of the soil and climate. So dry is it, so little radiation is there, that I have often left delicate instruments uncovered in the open air all night, and never found the slightest particle of rust from dew or other moisture.

The year 1873 will long be noted for its explorations. The Government of South Australia in that year fitted out an expedition to solve the problem of the waste. Mr. William Gosse was the commander. He was well supplied with camels by Mr. Elder's courtesy, with horses, men, provisions and a dray, but after 600 miles of the same dreadful burning sands, spinifex, sandhills and samphine flats, he was driven back. Mr. Gosse was a scientific surveyor, and much valuable data was gained by his journey.

The same year Colonel Egerton Warburton, then an old man, undertook to reach the western coast. He was well supplied by Messrs. Elder and Hughes with camels and everything required. Accompanied by his son and some other men, he started to cross a country barren in the extreme, was driven north for lack of water, and finally arrived on the Oakover River. His party was in a terrible condition, and were then starving upon one teaspoonful of

flour a day. For nine days Warburton, worn out by starvation, was strapped upon a camel's back. When the river was reached he was carried into the water, and some of his party went in search of a station, known to be a short way off. After they had been gone some time Warburton had to kill his last camel for food. He thought there was a station seventy miles distant and expected relief, but the station was really 170 miles away, and when help arrived he and his companions were found too weak to stand up, and crawling about on their hands and knees. Warburton received the gold medal of the Royal Geographical Society, as also an honor from Her Majesty in the shape of the decoration of Commander of St. Michael and St. George.

Giles, undaunted by his previous failure, once more set out from the telegraph line, this time just far enough south to escape the dreaded Lake Amadeus. He was accompanied by Mr. Tietkens, and had two men and twenty-four horses. As on previous occasions, enough water was found to justify a halt occasionally, but generally only a hole in the sand or a clay pan, which was soon emptied. Generally they passed through good mountainous country, but the natives were very troublesome. The party soon ran short of provisions and began to eat the horses ; and an explorer's horse is not an appetizing dish. I have seen a poster in New York on some of the walls, which is a capital picture of an explorer's horse. It is called —No "Time" here. They found one excellent patch of country where melons, pumpkins, corn, wheat and cucumbers grow well. The seeds were sown by the party, and on their return the fruits were found ready for the table. They camped here for some months.

A most remarkable case of endurance occurred on this expedition. Mr. Giles and a man named Gibson left the depot with four horses and a few gallons of water to go in search of another water-hole. After traveling for one hundred miles they hung up in a tree one five-gallon keg of water and two water-bags, and then turned two horses back, imagining that they would return in their old tracks to the camp. After following the trail for two miles, however, the perverse animals turned off and went south. Mr. Giles pressed on with the other two horses, a little water and a few strips of beef. One of the horses gave out after traveling sixty miles farther, and he decided to send Gibson back upon the remain-

ing animal, with instructions to take half the water left in the tree for himself and beast, and leave the remainder. The man was further instructed to go to the main camp, obtain assistance and return to Mr. Giles at the tree where the water was. Gibson arrived at the tree, took half the water and went on, but, unfortunately, he followed the tracks of the horses going south instead of going to the camp. In the meantime, Mr. Giles walked back through the soft white sand sixty miles to the tree, where he found the water-keg and a few small strips of beef—probably five ounces. He sat down exhausted to await the arrival of the relief party. He, however, still went on after resting, and his surprise, grief and mortification were intense when he found that the horses turned adrift had gone off the track, and that Gibson had followed them. Carrying the keg of water on his back, he set out towards the camp on foot. He went on for several days until, worn out and famished, he stretched himself upon the sands. While thus prepared to give up the ghost he observed a small opossum in a tree. Hoping to obtain enough food to give him a little longer hold of life, he drew his pistol and fired two shots at it, but missed both times. There was only one charge left in the weapon. Everything depended on the last shot, and his excitement was so great that he did not dare to fire for several minutes, fearing he would miss, and thus lose the last visible chance of saving himself from a fate too horrible to be thought of. His last shot was fired with trembling hand, and the animal leaped lightly away, unharmed. Giles did not even then despair. He had then traveled 120 miles. Food he had none, and as the water was exhausted he abandoned the keg. Crawling upon his hands and knees, he still went forward until within twelve miles of the camp. Here he picked up a young opossum which the mother had dropped from her pouch, and devoured it ravenously, skin and all. This prolonged his life a little, and he was found by the main party still crawling on his hands and knees, the flesh wasted to the bone, delirious from famine and fatigue, yet still keeping on the track. After a few days he became strong enough, the party set out in search of the missing man, but although they traveled four days along the tracks of the straying horses they could not find him ; but his trail was seen still leading south. The safety of the expedition compelled them to reluctantly abandon the search. Three years afterward Mr. Giles went again in search of his lost

companion, but no traces of him were ever found. He was probably devoured by wild dogs, which roam those dreary solitudes.

In 1874 Mr. John Ross, fitted out by Mr. Elder, tried to push his way west, but returned with the same dismal tale, after traveling some four degrees of longitude.

Very soon after the arrival of Colonel Warburton in Perth, Western Australia, where he came from Roeburn in a sailing vessel, the government of that colony fitted out an expedition under John Forrest, who was destined to bring to a successful issue an undertaking requiring coolness, nerve, and determination. His party consisted of four white men and two black. They had plenty of horses, with a good outfit. He followed up the Murchison River, and then struck across for the telegraph line. After much privation the party was fortunate enough to strike Giles' Furthest West of his second expedition, which facilitated their further advance. When Forrest arrived in Perth, after an absence from civilization of six months, he was received with much éclat, and received the gold medal of the Royal Geographical Society.

Having given the brief statement of a few of the principal expeditions in the exploration of Australia down to 1874, I shall, before entering upon the one in which I took part, give a short account of the aboriginal inhabitants, the geology, flora and fauna of this great continent.

It will be impossible for me to give any lengthy description of the fauna or flora, botanical or geological resources of Australia, and I shall therefore only deal with them very casually. To the botanist Australia presents a wide and varied field. Almost all tropical trees and plants grow, while eucalyptus trees (*Eucalyptus globulus*) are of enormous growth, 350 to 400 feet high, and I believe that one specimen in the Warragong range is lying on the ground, which measures 420 feet in height, or rather length. There casuarinas, acacias, banksias, hakeas and leguminosæ species predominate, while there are endless varieties of ferns. A peculiarity about the trees is that they begin to die at the top and die downwards, and that they usually shoot the bark instead of the leaves. There is an absence of edible fruits, except a few berries and a few small indigenous peaches. There are several poisonous plants, which deal destruction amongst cattle and sheep. The grass tree (*Xanthorrhea*) also grows and is very common; they are called black boys in

Western Australia, because at a distance they look so much like natives. Once, while watching for a surprise at dusk from natives, I fired at a grass tree which I had not noticed. I heard the ball strike, and was alarmed not to see my victim fall and to think that he was so invulnerable. The scrub so often alluded to may be anything, but is generally mallee, or a species of eucalyptus. It covers fully one-fifth of the whole colony, and the monotony of traveling through it can only be understood by experience. For days and weeks and months you may be in it without seeing twenty yards in any direction. It is in this scrub so many lives have been lost from time to time.

The geological formation is for the most part composed of primary rock, which forms the bed of table-lands. This is pierced and rent occasionally by other igneous rocks of trappean formation. These are occasionally heaped into mountains, but they generally present a gentle undulating surface, or form ridges of rounded contour, but of little height. They are interspersed with strata of rocks of metamorphic origin. Rocks of the secondary stage prevail on the coast. The most notable of them is the carboniferous, and the plains of the western interior are tertiaries and recent sedementary deposits. The present conformation of the territory is doubtless due to the volcanic origin, though no recent action is apparent. On the northern coast the principal formation is a hard ferruginous sandstone.

The zoology of this immense tract of land is peculiar and interesting. It is distinguished by the great majority of marsupial or pouched animals, of which there are now few traces in any other part of the world. A few species, I believe, are still to be met with in America, closely allied to the Dasyures of Australia. Fossil remains are found in England and France, indicating that they existed there at a very early period, when other animals of this age were in their infancy. As you probably are aware, it is generally supposed that the mammalian tribe was developed from the marsupial. There are no ruminating animals, no pachydermata, and no carnivora, except the native dog or dingo. The kangaroo affords sport and food for the natives; and I have had many an exciting hunt after them. There are a great many species, and some of them will weigh more than 200 pounds. Kangaroo tail soup is considered an excellent dish. When the kangaroo is attacked and brought to bay, some of

the "old men kangaroos," as they are familiarly called, are very fierce, often killing the dogs and occasionally making it so dangerous for the hunter that there is a special charm in the chase, independent of the riding. The dogs used are generally a cross between a staghound and a greyhound, or a bloodhound and greyhound. They are much hardier than the greyhound, though not so nimble. Water and some beaver rats, belonging to the placental series, are peculiar to Australia. Upon the lakes and rivers in the north are found the black swan, the crocodile, dugong and turtle. In New South Wales the wallaby and the bandicoot, the wombat and the opossum, make their home, and also the native bear, who is not the terrible beast so little sought after in the west of the United States, but a poor harmless brute, with scarcely energy enough to move.

Birds in Australia are numerous. The emu is the largest, and somewhat resembles an ostrich, with which you are probably more familiar. There are swans, pelicans, geese, eagles, hawks, quail, pigeon, crane, heron, and the elegant native companion, parrots and parroquets in abundance. The reptiles are really beautiful—crocodiles in the north, and snakes, lizards, scorpions and centipedes in the south. I shall not readily forget the sensation I experienced when one night a huge black centipede, eight inches long, crawled upon my neck with his horrible sixty-four legs, and made his way to my feet leisurely, much to my disgust ; and though he was probably only a few seconds, I thought him slow. He is in the Museum at Adelaide, with all the whiskey he can drink. Insects are wonderfully prolific, mosquitoes and flies being particularly abundant. The native children are sometimes hardly recognizable, so completely are they covered with flies, filling their eyes, noses and mouths. When eating, it requires dexterous manœuvreing to get a piece of meat into one's mouth without its complement of flies. It is essential on the river and creek bottoms to wear a fly-netting constantly about the head. Spiders are very common, as also are ants, the tarantula being the most formidable of the former and the bulldog-ant the worst species of the latter. These ants are an inch or more in height and about two inches long. They all fight fiercely, and their sting is not at all to be desired. They catch hold of your skin with their nippers, bend the body under like a scorpion and put the sting gently in, leaving the venom and sometimes the sting

itself. When camping near a nest of them, we generally thrust a firestick in the hole, which has the effect of keeping them at home.

The fish are whales, seals, sharks, codfish, snappers, mullet, and hosts of others not found in any other part of the world.

The natives of Australia are a much maligned and misunderstood race. They have generally been described in one category as the most depraved and degraded of mankind, some going so far as to say that they scarcely deserve to be called human beings ; that they are cannibals, and torture their victims with much cruelty. Such accusations are false in the extreme, and can, I think, only have been used as an excuse for their extirpation, which is taking place rapidly, as was the case in Tasmania years ago. Many Australian tribes are already extinct, and in the course of another century or so an Australian black will be looked upon as an individual of a by-gone age; for as the white man advances in search of new pastures for his flocks and herds, he drives the native back from his home and hunting-grounds. The invasion is disputed for a time, and the revenge, which generally reflects back to the savage, with the introduction of fresh style of living, and to them new diseases —tobacco and spirits—soon, if they are not killed outright through self-protection, so undermines their constitutions that they soon succumb to its certain poisonous influences. Protectors of aborigines have from time to time been appointed in each colony, but what can they do other than give these natives blankets and food, under certain conditions, which of course are never kept, and the protector's provision goes generally for tobacco or spirits, or both, and they are worse off than ever. This is very much the same case, I imagine, as the Indian of this country and the Indian agent. The Australian black is not naturally so depraved as many other races better cared for and better known. Though many writers declare they are cannibals, one going so far as to describe the searing of the skin with a fire-stick, the peeling of the skin with a piece of flint, and the nails, and finally building a fire for the roast; that they eat their friends, whether they are killed or die ; but never toast their foes with any cannibalistic designs. I have never found any traces of such habits, either torture, cannibalism, or scalping; any native whom I have asked has scouted the idea with disgust; and I have seen their graves and heard them burying their dead. The tribes, however, differ so in different parts of the continent, that what is

probable, and even true, in one location, would be false and ludicrous in another, and the knowledge of any such news to the strange black would be received with incredulity. Writers have always had to deal with natives on the coast and on rivers, where they are much finer specimens of humanity, better fed, and drink good water, owing to the rivers having good food and water in their contents. Those living inland are smaller, thinner, and dirtier, but I never found them very bloodthirsty; they are treacherous, as are all uncivilized races. Religion they have little or none, though they believe the spirit is immortal; they believe that the dead sometimes return in another shape, hence the reason they carry him round and round the grave at some distance, in order to puzzle the dead man as to his whereabouts. They are also in abject terror of an evil spirit, called Chinchi. Buckley, an escaped convict, who lived with the natives for thirty-two years, tells that they took him for the spirit of a deceased chief, especially as he made his appearance to them with the dead man's spear-head, etc., which he had picked up on his grave. There seems to be no government amongst them; but where anything is in dispute, it is referred to one or two of the oldest men for arbitration. Their arms consist of two kinds of spear, one long and heavy, and one very light; the former for warfare, and the latter for the chase; the war spear is barbed with six or seven pieces of flint, stuck on with gum from the grass tree or blackboy (*Xanthorrea Quadrangulata*), and bound on with the sinews of some marsupial animal; these spears are projected by means of a wommera, a light, flat piece of wood, with a piece of bone bent back from one end; this fits into the end of the spear, and acts as a third joint of the arm, giving the spear great impetus, and I should not like to hold out my hand at sixty yards for a spearman to throw at. A thick stick, with a large knob on the end, called a waddy, is used for warfare, both foreign and domestic. They also use a wooden shield, a piece of wood three feet long and nine inches wide, convex on the outside, and hollowed inside with a bar across, through which the arm is thrust, and they are skillful in its use. The celebrated boomerang, described facetiously as a sort of returning board, because, I suppose, it is always uncertain as to its movements, is a curved piece of thin wood, which, by means of a combination of forces, can be thrown with great dexterity, making the most curious evolutions, and puzzling any one standing near as to

where it is going to stop. It is unsafe to take shelter behind a tree, for one may be taken in the rear or on the flank. There is also a sword—a piece of hard wood, from six to eight feet long, and nine inches wide, and half an inch thick. Two natives will have a dispute, which they will settle thus: one will put down his head, and the other will come down with his sword, stunning and felling his opponent; if he comes round, it is his turn to go at the first striker's head, and so on, until one or the other is satisfied. They are polygamists as a rule, and as the sexes are nearly equal in numbers, there are often disturbances; in fact, most quarrels are caused by the fair sex in that country, as in many others. Some tribes tattoo their faces; some bore holes in their nose, through which they put a piece of bone; others bore their ears, and some knock out a tooth. In winter they cover portions of their bodies with skins, and in summer go entirely naked—that is, where the gentle influence of the missionary or teacher has not been felt. They build a shelter of branches in wet or very cold weather, but generally sleep in a row, each in a trough scooped out of the sand, with a fire between. Their coiffures are varied, according to tribe and taste. They indulge in plenty of pomade and cosmetics; some wear chignons, others curls; some are lazy and slovenly, wearing their hair down their backs, others in a knot, and some in a queue—that is, amongst the men; the lubra's or wife's hair is always cut by her lord. The natives on the coast live on ducks, geese, emu, kangaroo, fish, etc.; and the interior blacks live on what they can find—wallaby, kangaroo, rats, snakes, lizards, grubs, etc., all of which are found good when one is hungry. In the spinifex country the shins and feet, through coming constantly in contact with the sharp spurs of the spinifex, or porcupine (*triodia*), have a corn, or hard skin, which acts as a sort of shield. This grass is the terror of men and animals; it was, I believe, the main cause of the return of Mr. Gosse's expedition. It is a grass growing in tufts of from four to six feet in circumference, and about three feet in height; in appearance very like the yacca, or soap weed, seen out in the west of this country. It is sharp as the finest needle, and to this day I have a lively recollection of being thrown from my camel into the middle of an unusually fine specimen, and landing in a sitting position; for days walking was painful, riding out of the question, and after which I had to eat all my meals standing. There are two kinds of the grass, one

growing on rocky places and in moderately good farming country, and the other in the horrible mallee scrub. I have eaten the young shoots, but when old it is worthless, unless some ingenious individual some day utilizes it for making paper, or something else. There is plenty of it.

A black fellow and his lubra will never go anywhere without a fire-stick; when traveling it is the duty of the lubra to carry this, as also her husband's spears, shield, boomerangs, aud other impedimenta. She also carries from the water-hole any water that may be required for the camp. This is done in a vessel made by tying both ends of a piece of bark into a sort of canoe; and with it she carries her fire-stick, waving it backwards and forwards, in order to keep it alight. The camp is seldom pitched less than a quarter of a mile from the water. Were it pitched nearer, animals and birds would not come and drink, and so give the native a chance of getting some food. A native will wait patiently for hours cramped up in a small water-hole, waiting for a chance of using his spear or boomerang. An Australian black fellow is not very gallant, as may be inferred from my previous remarks; his dog gets much better treatment than does his lubra. She sits alone and behind him during his meals, and if he comes across anything objectionable in the way of sinew or gristle, it is thrown over his shoulder to her if the dog cannot manage it. There are one or two tribes that adopt a noteworthy way of treating a baby. When a child is born, the attendant buries him up to the neck in the hot sand. A two hours' sojourn in the desert sand is an excellent way of initiating the young negro into the hardships of this wicked world; and then he comes out well baked—a glorious remedy for infantile chilliness of feeling. He is handed at once to his delighted mother, and the whole thing is ended.

The natives are fond of dancing, and every new moon hold a grand corroboree, or camp dance, generally painting themselves to look like skeletons, bedaubing the ribs, spine, and other prominent bones with white pigment, which gives them a ghastly appearance. They also use Wilga, which is red ochre and charcoal, mixed with grease. The women at these dances beat time on a sort of drum, formed by a skin stretched over a piece of wood, or across their knees. Most fantastic is the dance which ensues, and almost perfect time is kept. They are extraordinary mimics, and during the

corroboree, the jumping of the kangaroo, the long ungainly stride of the emu, or any peculiarity in the gait of a friend or enemy, is enacted amidst the hearty plaudits of the onlookers. There has not as yet been found any bones or fossil remains of the human race, or any weapons or implements to indicate the antiquity or description of man; and it is within the limits of possibility that the present aboriginals are of Papuan origin, having been in communication with New Guinea when Australia and that island were one, which is also possible, as the channel now between the two islands is only 70 miles wide, and in no place more than 60 or 70 feet deep, and if there is an upheaval in one part of the continent it is probable there will be a depression in another; the distribution of fauna in both also pointing to the conclusion that they were formerly connected.

I shall now, ladies and gentlemen, conclude my paper with an account of the last expedition, being the one in which I participated. In 1874 Mr. Elder determined on sending an expedition across on the thirtieth parallel, about 400 miles south of Forrest's course, to the city of Perth, and so set at rest the conflictive surmises of what really was in that much dreaded country. Mr. Giles was selected to be the leader, and he made his old associate, W. H. Tietkens, second in command, while I had the honor of acting as observer and naturalist, under instructions from Mr. Elder to go up to his large station north at Beltana, and get arms, ammunition, and camels ready for our departure, and await the arrival of Mr. Giles and the other members of the party. One hundred miles by rail brought me to Burra-Burra; I then had 180 miles to ride in the most springless, rickety coach imaginable, and as it generally went at a foot pace, and made frequent stops, I preferred to walk—excellent training, but rather tiresome. From Blimman, where there are copper mines, I rode on horseback to my destination. My baggage, including the blankets and clothing, only weighed thirty-two pounds, and consisted of two flannel shirts, two pairs of socks, two pairs of leather inexpressibles, and two pairs of boots, besides the things I then wore. I got all our provisions ready sewn up in green-hide bags, as a protection against the scrub.

The latter end of April Mr. Giles arrived, having come up from the south coast, where he had been exploring near Fowler's Bay. He lost all his horses coming through; two camels carried his party 220 miles without water, besides carrying enough to supply the

horses while they lived with a bucket of water each day. They passed through a horrible country, and suffered greatly.

When all was in readiness, we left Beltana with five white men, two black boys, two camel-drivers, and eight months' provisions. One camel-driver became exhausted the first day, and was sent back. These camel-drivers have religious observances that sometimes are annoying. It is their custom to pray five times a day, and although we did not object to their worshipping, we dislike to have them wait so long; so, to make them quick, we took the camels on, so it was with difficulty they could catch up with the party again. Their zeal for prayer generally exhibited itself at times when we were obliged to stop on account of a broken nose-line, or some other mishap. We had three kinds of camels—bulls, cows, and bullocks. The idea of using bullocks had always before been scouted, but we risked taking them, and found them to have very superior qualities of endurance, better than either bull or cow. The latter we used for riding, and the others for beasts of burden. They carry great weights. Our average was 500 pounds at starting, and I have seen one old fellow we had laden with half a ton. We stopped at Port Augusta a day or two, and then made our way northward to the west of Lake Torrens, a dry salt lake, to Elizabeth Creek.

Shortly after our arrival at Lake Gairdner, we crossed the tracks of Mr. John Ross, whose failure I have already mentioned. As we left Mount Finke with only ninety gallons of water, we could not afford the extravagance of making tea, since too much of it would be wasted in the shape of steam. On the second day it commenced raining, and we had to stop on account of the saddles getting wet. A damp saddle on a camel's back is not comfortable, and the camels do not like it any more than the riders. Camel-riding is generally as safe as the rider chooses to make it. The ordinary saddle consists of three wooden crutches, fixed at a distance of eighteen inches apart, on two bolsters, which fit along the camel's side, the hump being immediately under the second crutch. This arrangement keeps the saddle off the camel's loins and shoulders. Between the crutches the traveler puts his blankets, and other scanty luggage. On the sixth day out, we had our first experience in eating the grub, a chrysalis found in the roots of trees. It is about as long as one's finger, soft and juicy, but with a hard head, crushing of which is objectionable. The taste is peculiar, but one can acquire

a strong liking for it, if hungry. The natives cook it, but we did not.

From Lake Gardner our way was over the highest of sandhills and prickliest of spinifex, the densest of abominable scrub, and the most yielding of soft white sand.

From Mount Finke to Youldeh our journey was not difficult. Though sand-hills were plentiful, the water-holes too were frequently found, and we arrived without mishap. Mr. Giles left Youldeh, and went south to Fowler's Bay, taking with him one black boy and three worn-out camels. Mr. Tietkins, the second in command, and myself, with four camels and provisions for one month, started north mainly to find water for a future depot. We intended to push forward to the Musgrave range, previously discovered by Mr. Giles, and after recruiting there make our way back. We were fortunate enough to find in the course of 100 miles' traveling, a small water-hole containing a few gallons. We returned to the depot, and brought up the party. Mr. Giles having returned from Fowler's Bay, our party now consisted of seven men instead of nine, as at starting from Beltana. From this place, which is called Ouldabinna, Mr. Tietkins and myself again went north in search of water, while Mr. Giles, with two men, went west with the same object. We traveled more than 100 miles out, but were obliged to return unsuccessful, fearing the water at Ouldabinna would give out. The natives were very troublesome, and that fact also hastened our return somewhat.

We were wise in coming back so soon, for the water was rapidly diminishing. Three days later Mr. Giles returned, having traveled 150 miles west, and found a small native dam with a little water. As to turn back would be defeat, we determined to go to this little water-hole, hoping that in the meantime the skies might send down a shower to augment its scant supply. We set out for it, husbanding our little remaining water. Day after day, with the fierce sun shooting his fiery darts at us from a cloudless azure sky, we trudged wearily on. The glaring sand reflected the heat with terrible intensity and effect, scorching our faces and giving rise to a blinding mirage. Seen under these conditions, the desert seemed to stretch

> "In airy undulations far away,
> As if the ocean, in its gentlest mood,
> Stood still, with all his rounded billows
> Fixed forevermore."

On the tenth day we were in a terrible condition, and one of the camels died. That very night a cooling shower descended, and we were saved so far. But for the rain we certainly would have failed, because the dam was still distant two days' journey, and it would be quite dry through evaporation. After resting here a week, we had to traverse 337 miles, occupying seventeen days, without seeing a vestige of water. Without the rain, this would have made in all twenty-nine days and 517 miles—a period too long to be endured by either man or beast under the intense heat of that dreadful region. Leaving this refuge we traveled west, not knowing when we should again reach water or find a living thing. It proved to be a race for life. On the twelfth day we were reduced to such a pass that we held a council to decide how to dispense with some of the camels. We decided to take them all with us, trusting to Providence to help us out of our difficulties. And so we struggled forward until the seventeenth day, when the black boy found, to our joy and surprise, a water-hole sufficient to last the whole party a fortnight. We had great difficulty in restraining ourselves from plunging into the water and drinking freely ; but, after a long thirst, such an indiscretion would probably have proved fatal. Under such conditions the tongue must first be moistened if very dry, the mouth should be washed out, and when the body becomes cool a small draught may be taken.

To the enterprise shown by Mr. Giles, in thus risking the fate of the party upon the chance of finding water, may be attributed the success of the expedition. Had we proceeded in the same manner as the other explorers, we should never have got 200 miles from home. Had we never left one camp until we found water to justify moving to another, we should probably have stopped at the first depot and returned home from there. At the point where water was so happily found we remained a few days to recuperate. We found there large wooden swords and a few boomerangs, indicating visits of the natives. None of them came into sight, but before the fierce luminary sunk into his grave below the sands and darkness fell, we could see the smoke of their bush-fires far away on the horizon. It would be difficult to describe the sentiments inspired by such a scene. The imagination found free play in wondering what strange scenes were being enacted around those will-o'-wisp like flames that danced over the darkened sands, and in picturing the weird, mys-

terious, wandering children of the waste gathered there, perhaps to celebrate some barbaric feast.

There is something awe-inspiring in the night that settles upon those mighty solitudes. Like a vast ball of molten brass, the day-god rolls down the evening skies, and scarcely has his golden disc disappeared below the horizon when darkness falls. The absence of the heavy banks of clouds that prevail in this latitude prevents radiation to any extent, and consequently there is none of the lingering "twilight gloamings" so dear to the poet's heart. There is no distant low of home-returning cattle, no dewy-fragrant breeze from flowery meadows, no chirp from nestling birds, and no smoke from cottage roofs ascending like incense in the evening air—none of the sights or sounds which we associate with the close of day. The sun has scarce disappeared from view, when all the starry hosts of the southern sky flash forth with a brilliancy unknown in northern latitudes. The heat given out by the sands renders the night air scarcely less ardent than that of day, and there is something solemn and impressive in the absolute silence that prevails o'er the earth and sky—not a leaf to rustle or the crackling of a twig to break the stillness. The croak of a raven, even, would be music to the straining ear. Lying around our little fire, kindled in the midst of this mighty desert, on a spot never before visited by civilized man, we gazed into the darkness that encompassed us, and giving wings to the imagination revelled in a realm where spinifex, samphire flats and water-holes were alike forgotten.

Mr. Giles sent two men ahead forty miles from Queen Victoria Springs with water, which was deposited in a canvas trough, so that we might give the camels a drink. The main expedition reached the spot in safety, and found the water had not been touched by the natives. It was given to the camels, and we traveled onward, having 220 miles to traverse through scrub and spinifex before reaching water again. Over this territory native hunting fires were seen day and night in every direction.

The picture of a native camp in a place where there is vegetation, is something like this: A few gunyahs of fresh-plucked boughs scattered about; a blazing fire of decayed wood, the smoke from which ascends perpendicularly in the tranquil air. Outstretched on the ground, men and women lie, some naked, others enveloped in blankets or rugs made of opposum skins. A few are seated, raven-

ously devouring lumps of half-raw meat, which they tear to pieces with their fingers. After a time shouts are heard in the distance, as the belated hunting parties return. The sleepers are aroused, fresh fuel is heaped upon the fires, the food brought by the newcomers is cooked and eaten in about the same fashion as a dog would dispose of a chop, and then the entire encampment joins in a wild, fantastic dance.

On one occasion we sojourned at a water-hole where several blacks came into the camp. We fed them and clothed them. That is, we tore a red handkerchief into thin strips and tied a strip around each head. The following morning a score of natives came in for breakfast, but we were fasting, and they had to imitate us. Seeing they could get nothing they departed, leaving three men and a girl about twelve years old with us. These stopped for three days. While we were at supper on the third day I noticed the blacks were very intently watching a neighboring rock. Leaving the rest of our party, I went to where the blacks sat, and scrutinizing the rock, soon saw two black heads cautiously make their appearance. I gave the alarm, and instantly there appeared about 100 painted warriors, with spears shipped in their wommeras. We were just in time, and our shower of balls and buckshot somewhat checked their ardor—in fact, cooled it altogether. I believe one or two of their party were injured, but none of ours was hurt. The three men in our camp had seized tomahawks to attack us in the rear. One of them got around our leader's neck and hugged him most persistently, but a blow from the butt-end of a rifle parted the loving couple immediately. In the meantime the little girl, who had been jumping about all day, trying to make us understand that we were going to be attacked, ran off, and we were left in charge of a collection of spent spears and war feathers. The following morning we heard the blacks mournfully wailing their lamentations for defeat. The sounds died away gradually, and we lost all trace of the party. They departed, and, according to custom, probably carefully avoided the burial spot thenceforth for months or years. After sunrise the girl came fearlessly into camp, accompanied by her intended husband. She was about 6 or 7 and he 19 or 20. We had given him on the previous day an old overcoat to cover his nakedness, and a shirt to the girl. The ludicrous appearance they presented coming into camp the following day was increased by the fact that they had exchanged gar-

ments. The man had donned the shirt, which was much too short for him, and the girl coquettishly sported the overcoat, which enveloped her from head to foot.

But to return to our expedition. From Ullaring our journeys were easy as compared with those we had made, the greatest distance to be traversed without water being only seventy-eight miles. We saw from the top of a small hill (the first we had seen since leaving Mount Finke) a range of hills to the south. These, we argued, must be part of Mount Jackson discovered by Gregory, and we thought that Mount Churchman, for which we were steering, must be laid down incorrectly on the maps. This, however, turned out to be incorrect, for Mount Jackson could never have been visited by the Western Australian explorers, or if it had been, the hills from which we saw it ought to have been also laid down. Our appearance at Mount Churchman astonished a party of natives, who were unable to account for the presence of white men in that remote spot. During the latter part of our journey we lived almost entirely upon lowan's eggs. This bird is the native pheasant. It builds a nest in the sand, constructing the bottom of dried leaves and small sticks. Upon this is laid a thin layer of sand, and the whole is covered up with small gravel and sand. Each morning the bird deposits an egg, with the little end downwards, almost in the centre of the nest, and covers it up again. This goes on until seven or eight eggs have been laid. The nest will now be about 12 feet in diameter and 3 feet high. She then covers the nest with an additional layer of sand, and leaves the eggs to be hatched by the heat of the sun. It has always been a mystery to persons of an inquiring turn of mind how the young birds get out of the nests. The lowan is only about the size of an English hen pheasant, but the eggs are as large as that of a goose. The shells are so thin that it is very unsafe to boil two in a pot together, or even one unless it is carefully wrapped in cloth. The general method of cooking is to stand them on end near the fire to roast. Some thirty or forty of these eggs were found every day, and the older eggs being of course more mature than the fresh-laid ones, were less highly prized by those members of the party whose delicacy of taste was not fully developed. Although we found so many nests, I never saw but one bird. That one I shot and we ate, being much too hungry to preserve it. We were all suffering by that time from scurvy and from

ophthalmia. On waking in the morning, half an hour was sometimes required to unseal and fully open our eyes. Our clothing showed the effects of rough usage; buttons were very scarce, and the man who could patch his clothing with pieces of the original material was regarded as a fop and treated as such by the others. Pressing forward, despite these obstacles, we reached a small sheep station, the most outlying one in Western Australia. The owner was so surprised and frightened by our sudden appearance that he fled at our approach, leaving us with a thousand sheep. His old black horse was not sufficiently fast to take him beyond our call, and he was induced to return. He gave us a sheep, and we made such an onslaught upon it that in less than six hours we had picked its bones. We stopped at this point two days, and forwarded a telegram to the Government announcing our whereabouts. A detachment of troops was at once sent to conduct us to the city of Perth, 180 miles distant. We were cordially and enthusiastically welcomed there, as well as in every city and town we visited. Banquets, balls, and no end of receptions were given, and warm greetings compensated for the hardships undergone.

Our work, however, was not finished here. Mr. Tietkens and myself were obliged to leave the party. Mr. Giles, with the remainder, returned overland between the tracks of Messrs. Forrest and Warburton. The route of the return expedition was to lie about 500 miles north of that just described, or between the twenty-fourth and twenty-fifth parallels. The first part of the journey was over ground previously traveled and settled. Crossing the head waters of the Murchison River, Mr. Giles made his way to Mount Gold, previously visited by Forrest. This curious eminence rises to a height of 2,600 feet above the sea level, and is made up of blocks of ironstone. The compass is consequently quite useless in its vicinity. The Gascoyne was dammed up, and plenty of water was found in the main channel. On the first day of May, Mount Labouchere was reached. This rises 3,400 feet above the sea level. The Ashburton River was reached by traveling through stone and scrub country. It was nearly dry. One small stream, however, was found flowing down its sandy bed. The Ashburton is the largest river in Australia, and had never been traversed so far up. The banks were found clothed with eucalypti, but the valley through which it flows is stony, and not suitable for pastoral purposes.

Leaving the Ashburton and traveling in an easterly direction, the inevitable desert of spinifex and sandhills was encountered, even where water flowed. Occasional strips of good country were seen. Opthalmia again attacked the party, some members being struck entirely blind. The poison-plant was found at the head of the Ashburton, and most of the camels suffered severely from eating it.

The old, old experience of Warburton, Forrest and Gosse was encountered by Giles, although his party did not suffer so much for want of water as on the previous expedition. He traveled 220 miles in ten days without finding water, over sandhills, sometimes bare, sometimes clothed with foliage. Giles struck his old point on the Musgrave, and followed it down to Ferdinand Creek, previously discovered by him. This was found dry. He reached the telegraph line on the 19th of August, and found himself again amongst his fellowmen, and was received with that enthusiasm to which his plucky march so well entitled him.

As I am lecturing here only as the representative of the exploring party, I beg you will understand that I was not the leader of the party, and if you have any praise to bestow, you will give it to Mr. Giles, since we must give honor to whom honor is due; and if you wish to censure, please censure me for not relating the proceedings in a more satisfactory manner.

The facts obtained by all these expeditions indicate that the Central Waste is bordered on all sides by a belt, the greater portion of which is suitable for raising sheep and cattle. On the south there are many tracts which would make desirable sites for settlements, if water could only be brought to moisten the parched earth. While this fact is now regarded as an impossibility, some miracle of science may yet be wrought by which this vast desert shall be made to blossom as the rose. I believe water may be got by sinking, and, if so, millions of acres of beautiful country would be utilized. I wanted Mr. Elder to let me try, and he doubtless will on his return to Australia. There are in the middle half a million square miles (about one-fifth of the entire area of the continent) which offer nothing but barrenness and death to the bold invaders. The southern part of this wilderness is dotted with hills of soft, white, yielding sand, thickly clad with spinifex, scrub oak and other low shrubs, with an occasional group of eucalyptus trees. The northern portion of this desert is almost entirely destitute of even this useless

vegetation, and its bare sand hills have not even spinifex to relieve their arid glare. Frequently the intense rays of the sun in summer sets the parched foliage of the wilderness in a blaze, and devastating fires prevail, giving rise to hot winds, which make their presence felt in the outlying settlements. There are well imformed persons who believe that, despite their terrible nature, these lands will one day be brought under the control of man, It is stated that dense forests are increasing upon the continent, that the climate is becoming moister and more healthful from year to year, and that the country is gradually ceasing to be suitable for sheep farming and more favorable to agriculture. New South Wales is no longer regarded as a stock-raising district, and is now devoted almost exclusively to farming.

Districts formerly ravaged at intervals by fires, are now settled, and flocks nibbling the grass, preventing its growing long, and thus there is none for fires. It must be borne in mind, however, that all the knowledge of the waste has been obtained hurriedly, and that every expedition has been simply a wild race for life across the sands. A thorough knowledge of the waste can only be obtained by a series of experiments and observations conducted systematically by geologists and meteorologists, at stations erected upon the few oases. The many creeks, broad river beds, clay-pans and native wells met with would indicate that rain falls copiously at certain periods, and a thorough knowledge of these might enable well-equipped parties to leave the proposed stations, at such seasons, and under such conditions which would make it possible, and even easy, to deliberately and systematically prosecute their researches. A systematic series of such investigations could not fail to set at rest the question whether the waste might not one day become the scene of pastoral communities, or whether it is to be given over to spinifex, naked blacks and wild dogs, until the crack of doom.